Terry Husseman Sustainable Schools Awards

A Guide to Achieving Sustainability in Your School

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Education for sustainability is a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and cooperative actions. These actions will help ensure an environmentally sound... economically prosperous [and socially equitable] future.

President's Council on Sustainable Development

Acknowledgements

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Introduction

As human activities seem increasingly to take their toll on the environment, it becomes ever more important to recognize the interdependence of our society, our economy, and our environment. If the environment is too rapidly depleted of resources, there will not be enough left to support much of an economy for our descendents. Seeking ways to meet our present needs "without compromising the ability of future generations to meet their own needs" is to aim for sustainability.

The purpose of this guide is to help schools establish sustainability programs and to provide ideas for improving existing programs. It was developed also to serve as a resource document for schools wishing to compete in Ecology's School Awards program.

A sustainable school maximizes educational opportunities to create a learning community committed to contributing to a more sustainable future. In a sustainable school, students—and everyone else—sees the intellectual concern for a sustainable future mirrored in the practical decisions for the cafeteria's operation, in the inclusion of students and custodial staff in energy efficiency training and initiatives, in transportation policies, during the construction or renovations of school buildings, in the design and maintenance of schoolyards, etc. Some other ways to keep your school sustainable are waste reduction, recycling, composting, and selective purchasing.

One of the most critical issues that face school-age children of today is the quality of the world they will inherit. A school that both teaches and practices environmentally sustainable behavior offers children and the local community an important role model and provides them knowledge and skills that will help them better understand and respond to a rapidly changing world.

In practice, however, basic education priorities have made it difficult for teachers and schools to take on these additional responsibilities. Sometimes there is only one teacher willing to take on the extra tasks and responsibilities associated with creating and integrating sustainability-focused curriculum into their learning plans. Without support from other teachers, their schools, and school districts, these teachers often find the process an uphill battle. Teaching sustainability principles does not need to be a solitary task. All around the state, schools are finding ways to carry out their mission in a less wasteful manner. (See "***Appendix B*** – Examples of Waste Reduction and Recycling.")

Why Should Your School Incorporate Sustainability?

Sustainability programs can provide a positive environmental experience for the school community. Sustainability, waste reduction, and recycling concepts and procedures are important elements of a comprehensive environmental education program in classroom lessons for grades K-12 in all school disciplines from art to wood shop. Your school can be a part of this important effort to improve our management of material resources, build a sustainable society, and teach these important principles to our leaders of tomorrow.

To review Washington State laws and executive directives related to sustainability, waste reduction, and recycling, please refer to "***Appendix F*** – Laws and Directives."

Terry Husseman Sustainable Schools Awards

The importance of waste reduction as a facet of a fully developed resource conservation or sustainability program continues to grow as our state's resources are being depleted. Ecology rewards schools that embrace sustainability principles through the Terry Husseman Sustainable

Schools Awards Program. This awards program has evolved in pace with changing resource conservation policies and practices.

The purpose of the awards program is to acknowledge schools for their efforts at incorporating sustainable solid waste management practices into their schools and classrooms. The three award categories are Seed, Sustainable School Program, and Creative Environmental Curriculum. The awards are given only to K-12 public schools in Washington State. The program distributes as much as $20,000 a year with single awards ranging from $500 to $5,000.

Ecology staff are available statewide to help schools locate assistance or resources for implementing sustainability principles and waste reduction and recycling programs.

The next section will identify the award categories and sustainability elements, and provide tips on how schools can incorporate sustainable practices into their daily operations and learning.

Award Categories, Sustainability Elements, and Tips

The purpose of this section is to describe the three award categories, to illustrate how the five elements of sustainability can be incorporated into your program, and to provide some additional tips to help you incorporate the principles of sustainability into your school.

The Three Award Categories

Seed Award

The intent of this category is to encourage schools to take the steps necessary to embrace all five elements of sustainability. Funding is provided for initial start-up of basic sustainability programs, or for improvements to programs or projects that move them closer to sustainability. Schools can apply for assistance to:

- Purchase equipment needed for sustainability programs and educational material (for example: recycling bins, signage, composting equipment).
- Implement or expand sustainable activities.
- Incorporate sustainability lessons into the regular teaching curriculum, which meet the goals established by the State of Washington Environmental Learning Standards.

Sustainable School Program Award

The intent of this category is to recognize schools that have existing waste reduction, recycling, or sustainability-based programs.

Creative Environmental Curriculum Award

The intent of this category is to recognize original curriculum that:

- Introduces students, teachers, staff, and administrators to the concepts of sustainability including its social, economic, and environmental relevance.
- Strives to inspire a sense of environmental stewardship in the students.

The Five Elements of Sustainability

To successfully compete for an award, a school must exhibit at least one of the following elements including, but not limited to, the five areas listed below. Generally, a school that exhibits more of these elements will increase its chances of winning an award.

1. **Resource/Energy Conservation:** Recycling, material reuse, alternative energy (greenhouse, solar or wind-generated power), rain barrels, storm drain ponds, low-flow toilets, xeriscape (drought-resistant landscaping), procurement policies (requiring purchase of items with recycled content), and closed-loop systems.
2. **Biological Diversity**: Habitat restoration (wetlands, forest, desert, etc.) and native plant propagation.
3. **Waste & Toxicity Reduction**: Composting (food, lawn clippings, paper), elimination of pesticides and herbicides, use of nontoxic cleaning supplies, prevention or elimination of waste at the point of generation, and reduced use of chemicals in science and photography labs and in craft rooms.
4. **Social Harmony**: Student cooperation to create programs that directly benefit their entire school or community. Student development of activities that involve the public and that provide opportunities for them to partner with businesses and public groups working on environmental, social, and economic issues.
5. **Health & Wellness**: Modeling healthy food choices and exercise, creation of an environment safe from harmful substances for student activities and work.

Tips on Developing an Award-Winning Program in Your School

The following tips are provided to help you identify the kinds of information the judges are looking for when reviewing award applications.

Tips on Getting a Seed Award

Establishing a New Sustainability Program

- For detailed instructions on how to establish a sustainability program in your school, see "***Appendix A*** – A Step-by-Step Guide to Developing a Sustainability Program in Your School." It provides a clear description and specific ideas.
- For ideas on techniques or activities your school can do, see "***Appendix B*** – Examples of Waste Reduction and Recycling."
- To learn how to perform a waste audit and cost-benefit analysis, see "***Appendix C*** – Waste Audits and Cost-Benefit Analysis." It provides step-by-step instructions and a sample cost-benefit analysis worksheet.

When you are starting a new program, start small. For example, to kick off a waste reduction and recycling program, begin with an assembly to explain the purpose and mechanics of the program. You can often get assistance from your local city or county solid waste division or a local recycling company. After you have recycled successfully for two or three months, add a new item to your program. Other new activities you can add are composting yard debris or food wastes, or both. However, your basic program should be operating smoothly before you expand.

Enhancing an Existing Sustainability Program

Schools with successful waste reduction and recycling efforts for at least one complete school year may develop more comprehensive techniques. Areas for advancement include education programs and purchasing. In addition, waste reduction practices can be strengthened, and the number of items recycled can be increased. Schools may initiate community outreach programs or expand them. Some schools that have developed advanced programs have designed their own manual or plan of operation and provided expertise for other schools. ***Appendix B*** - Examples of Waste Reduction and Recycling may give you some ideas on additional practices that you can incorporate into your program.

General Suggestions for Seed Award Applications

When applying for a Seed Award to support either of the above efforts (developing or enhancing a sustainability program), clearly identify your program goals and your methods for achieving those goals. Because the amount of the award will be determined by the budget you submit, clearly identify the items you wish to purchase in support of your new program and their actual costs. If you are applying for seed money to enhance an existing program, explain the progress you have already made and identify the way in which the seed money will help you enhance this effort.

- Explain how the funds requested will help produce the desired results.
- Give a history on any previous efforts or attempts to develop or implement a program.
- Describe any challenges or obstacles you face, and identify any previous levels of accomplishment.

Tips on Getting a Sustainable School Program Award

Highlighting an Existing Sustainable Program

Applicants for a Sustainable School Award will be judged on the number of sustainability elements and the extent to which those elements are incorporated into the school. Judges will consider how the school provides opportunities for students and staff to be involved in the implementation of the sustainability elements. Other issues considered by the judges will be the history of the applicant's program, the challenges or obstacles faced, and the levels of accomplishment.

- Applicants should describe how their school provides opportunities for students and staff to be involved in the implementation of the sustainability elements.
- Applicants should provide a history of their program, challenges or obstacles they have overcome, and any accomplishments they have achieved.

Tips on Getting a Creative Environmental Curriculum Award

Applicants for a Creative Environmental Curriculum Award will be judged on innovation, creativity and their ability to meet all state curriculum requirements established by the Office of Superintendent for Public Instruction.

- Educates participants on the five elements of sustainability and provide methods/tools for implementing those elements.
- Must be original work.
- Meets the four goals identified in the Environmental Education Guidelines for Washington Schools.
- Uses environmental education as an integrating context for learning. (See the EIC Model™ developed by the State Education & Environment Roundtable <http://www.seer.org>. They describe their model as "a system of educational practices that interconnects 'best practices' in education into an instructional tapestry that improves student achievement by using local natural and community surroundings as a context for learning.")

Section 2

Appendices

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Appendix A

A Step-by-Step Guide to Developing a Sustainability Program in Your School

Following are steps you may choose to follow when establishing your school's sustainability program.

Steps in establishing your program

1. Form a sustainability or resource conservation committee to develop strategies and goals.
2. Designate a coordinator to oversee the program.
3. Conduct a waste audit to determine the needs of your program (see ***Appendix C***).
4. Research your market, contact/contract with local recyclers or haulers.
5. Design a step-by-step separation and collection system.
6. Provide resource conservation education and training for staff and students.
7. Implement recycling.
8. Monitor the ongoing program and make necessary revisions.
9. Relaunch the program with new incentives or contests.

These steps are described in further detail below.

Step 1. The committee

Form a sustainability or resource conservation committee to develop strategies and goals. Include representatives from administration, faculty, clerical staff, library, custodians, purchasing office, student body, and parent organizations. Input from all segments of the school community during the planning stages increases the likelihood of a successful sustainability program, even if it initially takes longer to come to agreement.

Duties of the Committee

The committee develops goals and plans the school sustainability program. Each phase or step should be carefully planned. A good program has the above listed basic steps in planning, implementing, operating, and maintaining the recycling efforts. After designing the program, the committee designates a program coordinator. In some schools a school administrator, a custodian, and a teacher work together as a coordinating team.

Goal Examples

a. Develop and implement an environmentally preferable purchasing policy reflecting sustainability principles when reasonably cost-effective.
b. Reduce the amount of waste generated by the school.
c. Reuse materials when safe and practical.
d. Recycle as many materials as practical.
e. Educate administrators, staff, and students in sustainability principles, waste reduction, reuse, recycling, and purchasing practices.
f. Meet the requirements for recycling procurement established by RCW 43.19A.
g. Voluntarily follow the guidance given to state agencies by the Governor's Executive Order 02-02.

Step 2. Coordination

Designate a coordinator or coordinating team to oversee the program.

Coordination Duties

- Oversee the sustainability program.
- Act as liaison to all school groups.
- Contact the local fire marshal regarding fire-code regulations (for recycling activity).
- Select vendors(s) and develop contract(s).
- Maintain contacts with the vendor(s).
- Establish timelines for implementing the program.
- Monitor implementation of each step of the program.
- Coordinate and schedule volunteers.
- Make regular progress reports to the resource conservation committee.

Step 3. The waste audit

Conduct a waste audit to determine a baseline for your school and to identify and prioritize activities for your program.

Typically, waste audits in schools indicate a rate from one-half pound of solid waste per student to about one pound per student per day. During the 180-day school year, each student produces between 90 and 180 pounds of solid waste. How much waste does your school produce in one year? Washington's goal of recycling 50 percent of our waste is a great challenge and opportunity for your school.

Step 4. Market research and hauler contracting

Research your market; contact and contract with local recyclers or haulers.

After you have completed a waste audit or other research into the content of your waste stream, contact recyclers and haulers in your area for market research. Recyclers operate profit-making businesses, and different recyclers collect different materials, offer different prices, and provide different services. Negotiate with recyclers on the price they will pay for materials and what services they will provide.

Some schools do business with more than one recycler. They may send materials to two or three different recycling businesses, depending upon prices for recyclables, collection schedules, materials the recycler will take, distance to the recycler, equipment provided by the recycler, or other considerations.

Questions for Recyclers

- Which materials will you accept?
- Which materials will you pay for? How much?
- Which materials will you accept at no cost?
- What materials will you accept only for a fee? How much?
- How should materials be separated, collected, and stored in preparation for your service?
- If the school delivers the materials to you, what are your hours of service or other important considerations?

What Services Will the Recycler Provide? Will the Recycler:

- Provide containers?
- Distribute promotional materials?
- Help organize the program?
- Provide transportation of recyclables from the school? "Scheduled" service or "on call"?
- Monitor and report totals of materials being recycled and amount of money earned by the school?

Contract

Negotiate a contract with a vendor. The contract should be for the entire school year, if possible. Fluctuating markets and fuel cost increases are reasons for a contract. The year-round contract provides consistency of service. If you are establishing a new program and wish to add materials later in the school year, include this provision in the contract. To identify recyclers in your vicinity, check in the yellow pages of your local phone book, call the Ecology's Recycling Information Line at 1-800-RECYCLE, or call the solid waste division of your local city or county public works department.

Transportation options

Contract-Haul

Some recyclers and garbage haulers will transport your recyclables. The collector usually provides large outdoor bins or dumpsters for contract-hauling. Some collectors are willing to collect materials with profitable markets but won't take other recyclable materials.

Self-Haul

Self-hauling is a commonly used option considering current market conditions. The school will need a van or pickup truck to haul the recyclables. Teachers, custodians, parents, or the local PTA are possible self-haulers. You can use money received from recyclable materials to help defray hauling expenses. Some recyclers take self-hauled materials that they won't pick up from a customer's site.

Other Transportation Options

Pickup by an existing intraschool delivery system or municipal collection is available in some school districts. Information on municipal collection systems is available from the city solid waste division. Intraschool delivery systems options are sometimes available within a school district. Contact the facilities department at your school district office. The PTA can be a source of vehicles and drivers for taking recyclables to markets.

Step 5. The collection plan

Design an easy-to-use separation and collection system to get your program started.

Classroom Paper

Though some recyclers take all recyclable classroom paper in one container as mixed paper, many ask that you sort classroom paper into two categories: white paper and mixed paper. If you do need to sort, separate high-grade white paper from mixed paper by type during paper collection. With the dual-bin system, place two small collection bins in each classroom. Suggested locations for the bins are by the classroom entrance or near the teacher's desk (for monitoring purposes).

If source separation is the chosen method, one bin contains all white papers: white notebook paper, white ledger paper, and computer paper. (If enough computer paper is generated, you may wish to separate it from other white paper because some recyclers have a separate market for white computer paper.) The second bin contains mixed paper, such as colored ledger paper, construction paper, and butcher paper.

Coordinate with your recycler on which grades of paper they want separated. Strategically place signs listing the types of paper allowed in each bin or create a poster with examples of appropriate types of paper for each bin. Then prominently display the poster near the paper recycling bins.

Office Paper

Source-separation methods of paper collection often use desk-side dual bins or a small, desk-top container with two compartments, one for high-grade white paper and the other for mixed paper.

Place dual compartments at each work station. Offices use a higher percentage of white ledger paper and computer paper than classrooms.

Clerical and administrative staff separate white ledger paper from mixed paper at their workstation. When a desktop container is full, staff can empty the paper into a central collection container themselves, or designated persons can collect paper daily from each workstation as well as each classroom. If you have newsprint, you could place three bins or compartments at appropriate workstations, or you could designate a special bin for newsprint in the faculty room or library. Paper can be collected once a day from workstations and classrooms and taken to central storage. Teachers, custodians, students, or PTA volunteers are possible collection personnel.

Cardboard

Cardboard is a large portion of the school waste stream. It is generated in kitchens, libraries, custodial workstations, administrative offices, laboratories, and classrooms. A cardboard box can be reused for storing recyclable items or school supplies. It can also be recycled. Unless specified otherwise by your recycler, cardboard should be broken down and flattened for storage and transportation to the recycler. Waxed cardboard and used pizza boxes are generally not acceptable, but details should be confirmed with your recycler.

Library

In addition to white paper and mixed paper, the library generates newsprint, books, catalogues, and cardboard. Place a separate collection bin for newsprint in the library or faculty room or central storage area. Schedule special collection days for books and catalogues as needed.

Central Storage

Designate a central collection station and storage space. The collection station and storage area(s) should be accessible, but away from traffic areas. It is helpful to place containers in the computer center, copy machine workroom, or other areas where large amounts of paper are used. Remember that paper collected from classrooms and staff workstations will also be stored at the central storage area.

Supply enough container space for the entire building for one day's supply of paper. Fire codes will not allow crumpled paper; therefore, paper must be stacked neatly in nonflammable containers. One option is to collect the paper at a central point, then empty the central containers daily in outside bins near the garbage dumpster. This provides easy access for the hauler, saves limited building space, and aids fire prevention.

On a space-available basis, other recyclable materials such as aluminum cans or cardboard may also be stored at the central collection site.

Selection of Central Collection Station

- Design and locate the collection station in accordance with fire code regulations.
- Provide necessary weather and vandalism protection.
- Label containers clearly for each recyclable material.
- Locate your central collection center for convenient hauling.
- Design the system for possible expansion.

Step 6. Conservation education and training

Education about sustainability is vital to the success of your school program. All members of the school community—administrators, faculty, custodians, clerical staff, students, and parents—should learn the importance of resource conservation. Concern for environmental issues, for waste reduction

and recycling, and for lowering the costs of waste disposal in schools may provide motivation for school programs.

An introduction to natural resource demand and supply along with a measuring of individual ecological footprints will focus staff and students on the importance of resource conservation in the school. To measure individual footprints, use the quiz developed by the Earth Day Network and Redefining Progress as a part of their Ecological Footprint Campaign. To learn more about the campaign or to take the free quiz, visit http://www.earthday.net/footprint/index.asp.

Steps in Education Programs

- Faculty and staff training workshops
- Assembly program for entire school
- Classroom activities for students
- Student body organization or recycling club promotion
- Recycling information program presentation for the PTA

Teacher-Training Program

The Washington State Department of Ecology's Sustainability Web site contains information about some of the steps that Ecology is taking to foster sustainable communities and natural resources within our state. You'll find information about the activities of the Sustainability Team, other sustainability-related projects Ecology is involved with, and additional resources to help you.

The Washington State Department of Ecology's A-Way With Waste program offers an on-line curriculum guide for Washington State teachers and staff. The Internet address for this resource is http://www.ecy.wa.gov/programs/air/aawwaste/awwwhome.html. For further information, contact Sandi Newton at 360-407-6826 or by e-mail at snew461@ecy.wa.gov.

Many city and county solid waste offices have educational programs for students and teachers. Assemblies, lesson packets, brochures, and classroom presentations are among the options available. Contact your local government solid waste office for further details.

Assemblies

Assemblies are a frequent place to begin waste reduction and recycling programs in schools. Skits, plays, art contests, and videos have been successful at assembly programs. The recycling coordinator can work with teachers, parents, and students to present the program. As noted, many local solid waste agencies or private citizens design and present assemblies.

Classroom Activities

Ecology's A-Way With Waste curriculum has lesson plans for grades K-12. Action-oriented activities for waste reduction, recycling, waste and water, and litter control are included for all classroom disciplines. City and county solid waste offices also have sample lesson plan packets for appropriate grade levels.

ASB or Student Recycling Clubs

In some schools, particularly at the junior and senior high school level, students may form a recycling club, or other organizations such as Future Business Leaders of America (FBLA) or FFA can collect recyclable materials, monitor the ongoing paper recycling program, record the data on computer disk, and coordinate self-hauling.

PTA Outreach

An outreach program presentation by staff and/or students to the PTA can arouse PTA interest and support for the program. Some schools have community drop-off sites or special collection days supervised by PTA members for recycling aluminum and newspapers.

Community Outreach Programs

Schools throughout Washington have community outreach recycling programs. Some have fund-raising activities such as newspaper drives, aluminum collection days, and Earth Day activities. Under current market conditions, only aluminum is a reliable money-maker for your club or organization. However, as an educational opportunity for environmental awareness, or as a public service to the community, community drop-off sites at the school and special collections are frequently organized by student clubs or PTA groups.

Schools can ask businesses to "adopt a school" or a classroom by providing collection bins or other materials needed to operate the school recycling program. The local PTA can help with hauling materials or promoting the program by making public presentations demonstrating the successes of the school's waste reduction and recycling program. Students can educate the community through poster contests, school open house, or presentations at PTA meetings.

Step 7. Implement recycling

This step will help you understand some of the tasks required in designing and implementing a recycling plan.

Design and Implementation

- Develop collection plan.
- Obtain fire marshal approval.
- Prepare training materials.
- Train staff and students.
- Have an assembly to promote the program.
- Coordinate with the PTA.
- Place containers.
- Begin recycling.
- Monitor the program.
- Make appropriate changes.
- Relaunch your program with new incentives.

A successful recycling program takes careful planning. Once you have conducted a waste audit to determine what is recyclable in your school's waste stream, you can design your program. If you cannot do a waste audit, the following information from other school waste samples may be helpful.

Sample Waste Stream

What materials found in the waste stream are recyclable? By weight, approximately 50 percent of the school solid waste stream consists of recyclable materials. Paper, the largest waste stream component by weight, comprises between 30 and 40 percent of the typical school waste stream. For further information on typical school waste stream items, see the "Cost-Benefit Analysis and Waste Audit" in ***Appendix C***. Listed below are items recycled in Washington State schools in the recent years.

* White ledger paper
* Mixed paper
* Newsprint
* Paper bags
* Phone books
* Steel (tinned) cans
* Glass
* Food wastes
* HDPE plastic
* Laboratory chemicals
* Motor oil
* Shoes
* Clothing
* Computer paper
* Cardboard
* Construction paper
* Books
* Catalogues
* Aluminum
* Other metals
* Batteries
* PET plastic
* Polystyrene
* LDPE plastic
* Paint shop residues
* Printer ribbons
* Toner cartridges
* Wood products
* Milk cartons

Some items listed above don't have markets in all parts of the state. For example, certain paper and plastic items have limited markets.

Paper Recycling

Because paper comprises the largest percentage of the waste stream, methods for recycling paper are given here as a separate section.

- Separate paper from other waste, and collect paper in designated recycling containers.
- Collect paper daily.
- Deposit accumulated paper in central containers.
- Arrange for pickup (or delivery) of recovered paper by (or to) recycler/hauler.

Consult with your local fire marshal when developing any portion of the collection and storage system. Local fire codes may prohibit the storage of paper in open containers. Other codes may require fire resistance in storage containers. Paper should be neatly stacked or bundled, never crumpled up. Some schools store their collected paper outside the school building in bins to save space in the school and to reduce the risk of a fire. Have your local fire marshal walk through your building with you before you initiate the program, to get firsthand advice on your storage and central collection system or other fire code concerns that you may need to address.

Step 8. Monitoring the ongoing program

Monitor the ongoing program and make necessary revisions. Some ways to monitor the effectiveness of your program include:

- Review data on savings realized.
- Review data amounts recycled or disposed of.
- Survey program participants to obtain feedback on awareness of program, level of participation, and recommendations for improvement.

Step 9. Relaunch the program

After making improvements or adjustments to your program, consider relaunching it with new incentives or contests. For additional ideas for relaunching your program, see **Step 6, Conservation education and training**, above.

Appendix B

Examples of Waste Reduction and Recycling

Waste reduction

The term "waste reduction" describes a set of actions that result in less waste. It includes making purchases and following procedures that bring you what you need rather than leave you with excess that you might have to throw away or recycle. Waste reduction can also mean using a less toxic material or choosing a product that was manufactured with less pollution. Reusing products, prolonging a product's life, or providing an alternative use for a product are all good ways to reduce waste. Purchasing durable goods and repairing goods are also important waste reduction methods.

Environmental Preferable Purchasing

Environmentally preferable purchasing (EPP) is the purchasing of products or services that have a lesser or reduced negative effect on human health and the environment when compared with competing products or services that serve the same purpose. This approach to purchasing takes into consideration the impacts of a product and packaging throughout the entire life cycle, including final disposition. When the choice is available, buy products whose manufacturers have demonstrated the same considerations. When the distributors you buy from don't offer such products, let them know what you'd like to buy.

Any school can adopt waste reduction practices. Purchasing provides many opportunities. Does your school purchase goods with less packaging? Do you buy products that created a lot of pollution when they were made? Do you use nontoxic or least risk chemicals? In laboratory experiments, do you conduct micro-experiments that create less waste? An inventory of purchases and a study of methods of your school's operation will reveal potential areas for waste reduction in administration, classroom, kitchen, and custodial services.

Prepurchase Review

When planning the purchase of materials, consider the following:

- Is this item or quantity a necessary purchase?
- Is there a more durable alternative for this item?
- Is a less toxic substitute available?
- Can this item have an adaptive reuse after it has been used as first intended?
- How will you dispose of this item?

Waste Reduction Resources

You can solicit waste reduction ideas from other schools. Establish a school district exchange of information. Find out what methods of waste reduction are effective in schools of similar size. Also, remember to research market availability for the materials you plan to collect and recycle. The solid waste division of your local city or county public works department should have waste reduction information and education materials for staff, students, and parents.

Waste reduction practices that have been used in Washington schools

Between 1992 and the present, the Washington State Department of Ecology has found the following waste reduction practices actually in use in public schools.

Classrooms and Administrative Offices

- Electronic mail in place of memos
- Memos routed instead of copying them
- Half-sheet for memos (if paper is really necessary)
- Quarter-sheet for event announcements/reminders
- Purchasing refillable pens and cartridges
- Purchasing refillable mechanical pencils
- Purchasing copy machine which copies on both sides of the paper
- Monitor number of photocopies made
- Use of electronic mail rather than fax machines
- Using computer (rather than paper copies) to review drafts of articles for journalism class
- Overhead mirror in cooking class demonstrations to reduce the amount of supplies needed
- Reuse of envelopes
- Reducing junk mail by student writing campaign
- Lessons and student drills on blackboards or whiteboards instead of paper (a time-honored technique!)
- Old socks as erasers for blackboards or whiteboards
- Using a computer with a projector, saving both paper and transparencies
- Verbal responses for evaluation instead of paper and pencil
- No use of consumable workbooks
- Back-to-back work sheets
- Making handout paper copies for the exact student count
- Waste paper and scraps reused in math and art classes
- Developing cooperative learning groups to reduce purchases
- Library reissuing student copies of research materials
- Older periodicals circulated to classrooms for reuse
- Discarded envelopes used for scratch paper
- Colored butcher paper reused
- A crayon-exchange box
- Scratch pads made from recovered paper
- Cardboard boxes reused for storage
- Reusing plastic shopping bags to store recyclables
- Newspapers shared with second and third families
- Students writing on both sides of paper
- Reuse of old file folders for art projects
- Reuse of cardboard and wood as sets for school plays
- A school “paperless” day
- Copy-paper ream wrappers distributed for textbook book covers
- Paper sacks used as book covers
- Giving certificates for using the same lunch bag five days
- Reusing wood and plastic scraps in technology class
- Double-sided copies for handouts and work sheets
- Waste reduction list placed in classroom
- Demonstrating waste reduction purchasing in home and family-life classes
- Articles in school paper on how to reduce waste
- Laminated master sheets for teacher’s reuse

Custodial Services

- Plastic liners no longer used in garbage cans
- Electric hand dryers or washable linen cloth to replace paper towels
- Reduce frequency of refilling paper towel dispensers to discourage use
- Bulk purchasing of cleaning solutions
- Diapers reused as cleaning rags
- Reuse of food buckets for mopping and cleaning
- Replacing toxic cleaners with less toxic or nontoxic alternatives
- Participating in chemicals-exchange program
- Use of least risk and nontoxic yard and garden chemicals
- Use of integrated pest management techniques
- Eliminating classroom waste basket liners
- Reusing plastic liners in garbage cans
- Reusable plastic recycle bins
- Salvaging wood from construction projects for reuse
- Installing reduced-flow water conservation nozzles for sinks and shower heads
- Installing waterless urinals in appropriate restrooms

Food Services

- Ceramic cups instead of disposables
- Purchase of squeezable, reusable condiment bottles
- Reusable aluminum and hard plastic trays for hot lunches
- Replacement of disposable plastic utensils with metal silverware
- Monitoring lunch room disposal to save reusable items
- Egg cartons and plastic jugs used to store supplies
- Five-gallon plastic containers reused as waste baskets
- Purchase of food products in bulk to reduce packaging
- A “garbageless” lunch by using reusable containers
- A kitchen steam boiler that reduces cooking time and energy use
- Daily collection and composting of food waste on site to be used by biology and horticulture classes

Miscellaneous

- Exchange table for “naturally packaged” foods
- Setting up a completely organic garden
- Having a “no plastic” school picnic
- Thrift store for exchange of reusable items
- School tables, chairs, and desks refurbished and repaired
- Milk cartons used as planter cups
- Cloth towels (not paper) used for cleanup in science room
- Bottle caps used for counting activities
- Environmental pledge signed by students to reduce waste
- Saving and reusing decorations from parties and dances
- Automatic on-off motion sensor lights
- Clothing drive for sharing with other families
- Reusable materials found in recycle bins sorted and reused
- End-of-the-year exchange of reusable pads, pens, etc.

Procurement

- Purchase of solar-powered calculators
- Buying recycled products when feasible (generally, manufacturing products from recycled raw material uses less energy and creates less waste)
- Obtaining rechargeable batteries and chargers.
- Implementing a procurement policy that strengthens awareness of waste reduction
- Maintaining a "reusable bin" in each room.
- Purchase of energy-saving fluorescent lamps

Recycling

Recycling is separating recoverable materials from the waste stream and then reprocessing the materials into new products. Recycling is often the most visible means of resource conservation in schools. Over the past 15 or 20 years, recycling has increasingly become part of our daily lives. Recycling efforts in Washington schools have kept pace with those changes.

Why recycle? Recycling saves energy, conserves resources, reduces disposal costs, preserves landfill space, and helps the environment. Does recycling make money? Yes, recycling aluminum and certain other materials can be a profit-making enterprise during favorable market conditions. Because of fluctuating market prices, recycling might not serve well as a primary fund-raiser for your class or club. However, a comprehensive waste reduction and recycling plan may save school district money in avoided costs for garbage disposal.

How does recycling work? It may include source separation and collection of materials, monitoring and recording totals, preparation of recyclables for transport, or transporting the materials to the recycler. It may include market research and a change in purchasing practices for your school. If your waste reduction efforts can't eliminate a purchase, can this necessary purchase be a recycled or recyclable material?

Composting

Composting is a biological process that stabilizes organic matter for use in soil enrichment. Compostable items include yard and garden wastes, lawn clippings, tree and shrub limbs, and food wastes. For specific how-to methods for each type of composting, contact the solid waste division of your local city or county public works office, or contact the Solid Waste and Financial Assistance Program of the Washington State Department of Ecology at 360-407-6900.

Types of Composting

- Yard and garden waste, greenhouse trimmings, lawn clippings, and tree and shrub limbs can be placed in an outdoor compost pile. The composted product is a good soil amendment.
- Worm bins are used to compost food wastes. Fruits and vegetables are recommended. Red worms (Eisenia Foetida) are the best composters. The product of the worm bin compost is an excellent fertilizer suitable for lawns, gardens, or houseplants.

Waste Reduction and Recycling in Laboratories

Following are some common waste reduction and recycling methods that Washington schools use in their laboratories.

Science laboratories

Waste reduction and recycling can work in science laboratories if you use preplanning and design your experiments with waste reduction and recycling in mind.

Waste reduction in experiments

Micro-scale chemistry uses scaled-down versions of laboratory experiments. Microchemistry reduces:

- The amount of chemicals needed for an experiment
- The amount of storage space required for chemicals
- The amount of waste produced
- The amount of waste for disposal
- The costs associated with acquisition, storage, and disposal of chemicals
- Include in your **laboratory procedure a** step called **neutralization,** adding a compound which treats the hazardous material and renders it into a nonhazardous state.

Waste exchanges

Another way to reduce waste is through chemical waste exchanges. The Industrial Materials Exchange (IMEX) in Seattle will list items for exchange with other interested organizations. You can contact them at 206-296-4899 or online at http://www.metrokc.gov/hazwaste/imex/index.htm.

The Portland Chemical Consortium at Portland State University, 503-725-4273, toll-free 1-800-547-8887 extension 4273, or online at http://www-adm.pdx.edu/user/pcc/conpack.htm#use) accepts chemicals from school science laboratories. The consortium advertises chemicals and thereby allows one school to exchange materials with other schools. If no one claims materials by the end of their shelf life, the donor school can reclaim the unwanted chemicals or decline their return. If the school declines the return of the chemicals, the consortium declares the chemicals to be "waste" and the donor pays a pro rata share of the cost of disposal by an EPA-licensed firm.

Disposal

Science lab instructors should conduct an annual inventory of materials and make a complete list of excess substances targeted for disposal. Specific federal, state, and local regulations may apply when disposing of excess or unwanted chemicals. **Before using any disposal option, review your selected options with local regulatory health officials.**

A **license is required** for you to conduct disposal. If you are licensed and approved, be sure to practice your disposal activity on a micro-sample of the targeted substance before you handle the larger or macro volume.

Another option is to hire a commercial firm to remove the hazardous chemicals. This option is often very expensive. Be sure to obtain references from the disposal firm. Contact the references for verification of reliability of service provided **before** signing any contract.

Chemical disposal information sources

- Washington State Superintendent of Public Instruction office
- Science Program Coordinator
- Local college or university chemistry department
- Other local high schools
- City or county solid and hazardous waste disposal section

- Washington State Department of Ecology's Hazardous Waste and Toxic Reduction Program
- Local office of the American Chemical Society
- Chemical Waste Exchanges

Waste Reduction and Recycling in Nontraditional Settings

Following are some examples of waste reduction and recycling methods that Washington schools practice in specialized classroom settings like home economics, shop classes, and agriculture programs.

Home economics

Waste Reduction Possibilities
- Preparing scaled-down recipes
- Using both sides of paper
- Use of nonhazardous oven cleaners
- Use of nontoxic dish washing detergent
- Purchasing biodegradable products
- Reuse of fabric
- Reusable metal silverware
- Reusable plates, cups, and dishes
- Weighing food waste
- Discussions on where food comes from, what resources are used to grow and transport it, etc.

Recycling Possibilities
- Paper
- Clothing and fabrics
- Milk cartons
- Plastic milk and fruit juice jugs

Composting Possibilities
- Worm bins for food scraps

Auto shop

Waste Reduction Possibilities
- Using least risk or nontoxic cleaners and solvents
- Purchasing products in only the quantity needed
- Sharing excess quantities of products with other auto shops
- Reuse of tires for playground or athletic equipment
- Buying re-refined motor oil

Recycling Possibilities
- Tires
- Used motor oil and transmission fluid
- Antifreeze
- Auto parts
- Copper and other metals
- Batteries
- CFCs from vehicle air conditioners

Welding and metal Shop

Waste Reduction Possibilities
- Reuse of scrap metals
- Collecting and reusing metals from businesses
- Design and use of scaled-down projects

Recycling Possibilities
- Metals
- Machine and cutting oil

Wood shop

Waste Reduction Possibilities
- Conserving wood, paint, and stain products
- Use of sawdust or wood chips in agriculture programs as bedding for livestock

Recycling Possibilities
- Clean wood products
- Paper
- Paint and stains

Art studio

Waste Reduction Possibilities
- Use of scrap paper for sketching
- Reuse of modeling clay
- Reusing metal or wood scrap materials for projects
- Using nontoxic paints and solvents

Recycling Possibilities
- Paper
- Paint
- Metals
- Art accessories

Agriculture (FFA) programs

Waste Reduction Possibilities
- Conserving materials by inventory and management
- Use of sawdust or wood chips as bedding for livestock
- Using least risk or nontoxic materials and chemicals

Recycling Possibilities
- Paint products
- Solvents

Composting Possibilities
- Animal dung for fertilizer
- Plants from greenhouse projects

Gymnasium, auditorium, stadium

Waste Reduction Possibilities

- Durable, reusable food service utensils
- Recyclable paper products
- Conservative use of solvents and paints
- Print and distribution of a fixed number of programs

Recycling Possibilities
- Paper
- Plastic
- Aluminum

Waste Reduction & Recycling in Building & Facility Services

Following are some examples of waste reduction and recycling methods that Washington schools practice in facilities and services departments including custodial services, kitchen, cafeteria, and the vehicle maintenance garage.

Custodial services

Waste Reduction Possibilities
- Inventory and management of materials
- Use of nontoxic strippers, thinners, paints, and solvents
- Repair and reuse of tools
- Purchainge only necessary annual amounts of materials
- Waste exchanges
- Use of nontoxic or less toxic cleansers

Recycling Possibilities
- Wood products
- Paint
- Cleansers
- Oil

Composting Possibilities
- Yard and lawn clippings
- Tree limbs

Cafeteria/kitchen

Waste Reduction Possibilities
- Purchase of reusable utensils and dishes
- Purchase of products in recyclable containers
- Providing more than one option for meals
- Keeping accurate count of daily lunches
- Inventory and update of kitchen materials
- Providing reusable cloth towels
- Purchase of items with necessary packaging only
- Discussing and determining where food comes from, what resources were used, transportation, etc.

Recycling Possibilities
- Glass containers
- Cardboard
- Steel cans
- Aluminum

- PET plastic
- HDPE plastic
- Polystyrene
- Paper

Composting Possibilities

- Food waste
- Worm bins
  Fruit and vegetable waste can be composted in worm bins. For further information on composting, call the solid waste division of your local city or county public works office.
- Swine Feeding Disposal
  Swine feeding is another option for food waste. A license is required to operate a swine-feeding program. Licensing regulations for feeding food waste to swine are outlined in RCW 16.36.105. For further information call the Washington State Department of Agriculture at 360-902-2025.

Maintenance garage

Waste Reduction Possibilities

- Inventory, management, and purchasing procedures
- Reuse auto parts
- Reuse tires
- Reuse fluids and motor oil when possible

Recycling Possibilities

- Motor oil
- Antifreeze
- Metals
- Tires

Product Exchange Programs

Advanced programs sometimes operate exchange programs, thrift stores, or community outreach projects for recycling. These programs facilitate the reuse of goods and materials that would otherwise find their way into the landfill. The local PTA or a student club can organize and operate this kind of recycling outreach program.

Comprehensive waste audits (see ***Appendix C***) will reveal new areas for waste reduction and recycling. For example, the purchasing agent for your district may buy recyclable items or recycled items for the school. Try to include in your purchases recycled materials, such as plastic, that need stronger markets. In addition you may substitute reusable or durable items in place of nonrecyclable or less durable items. Now could be the time to add difficult-to-recycle or compostable items to your recycling list. Examples are plastics, food items for worm bin composting or swine feeding, compostable yard and garden items, and used motor oil from the school bus maintenance division.

Appendix C

Waste Audits and Cost-Benefit Analysis

Following are examples of steps involved in conducting a waste audit and a cost-benefit analysis.

Waste Audits

Purpose

An important step in a waste reduction and recycling program is the "waste audit." The waste audit measures the kinds of materials and weight of materials found in the waste stream. When you design your program, the audit provides valuable information regarding which items to target for waste reduction and recycling.

If your waste audit reveals nonrecyclable items or difficult-to-recycle items in the waste stream, see if alternative products that are easily recyclable can be purchased in place of these products that are more difficult to recycle. The audit may also identify items in the waste stream that can be reused, removing them from the disposal path.

For those wishing to complete a waste audit, you may obtain a sample audit from the Ecology School Awards Coordinator. Also, city and county solid waste staff have conducted school waste audits in many areas of Washington and may be available for assistance.

An alternative to the comprehensive waste audit is a "sample site audit." To perform a sample audit, select several key rooms in your school. Select samples from 25 percent of the classroom garbage cans, the kitchen garbage can, the administration office, the teacher workroom, or the photocopy room. This will give you a representative sample of the contents of the school's waste stream. You will need a scale to weigh the samples, and you should wear protective clothing and gloves.

The best time to conduct the sample audit is before you begin your waste reduction and recycling program, or very early in the program. If you repeat the sample audit in the same selected areas three months later, you can measure the improvements made by your program.

Statistics on the amount of waste produced by each student are available from samples taken at schools. For example, in a waste audit of six schools in 1990, each junior high and high school student produced about .6 pounds of solid waste per school day. The Department of Ecology is currently compiling more information on waste stream content.

Cost-Benefit Analysis

Economics of Waste Reduction and Recycling

Although recycling aluminum currently makes money, recycling in schools should not be regarded as a fund-raising effort. Markets for paper or other products fluctuate with supply and demand. Most grades of paper and many other recyclable materials at current market rates will not make money for your school.

The greatest savings for the school or for the school district are in **avoided costs**. Reduction in dumpster fees and energy cost savings associated with waste reduction and recycling are the major financial benefits of any school resource conservation program. By selective purchasing, waste reduction practices, recycling, and composting, schools can decrease the number of dumpsters being filled per month by as much as 50 percent.

How much money can you save? Cost of disposal varies from one vendor to another. Careful monitoring of the reduction in dumpster fees per month, compared with the same period in the previous year, will provide waste reduction and recycling cost savings information. In addition, disposal costs may increase because of rising landfill fees. Any reduction in school waste disposal saves the amount of increased fees each year.

Sample Cost-Benefit Analysis

Basic cost-benefit information may be obtained from the work sheet on page 27. For more information, call the Ecology School Awards Coordinator, Michelle Payne, at 360-407-6129, or call your nearest Ecology regional office: Spokane, 509-329-3400; Yakima, 509-575-2490; Bellevue, 425-649-7000; or Lacey (Olympia), 360-407-6300.

The cost-benefit analysis will help you determine:

- Existing waste stream content and volume.
- Recycling potential and any revenue and/or cost avoidance resulting from recycling.
- Potential waste reduction resulting from recycling.
- Initial costs of setting up a recycling program in your school.
- Information for formulating an expenditure payback schedule.

Cost-Benefit Analysis Work Sheet

1.	Current solid waste disposal costs.	$_____/month $_____/year $_____/cubic yard
2.	Estimate volume that could be diverted from the waste stream.	_____/cubic yards/year
3.	Amount saved through reduced disposal costs. Disposal fee minus (cubic yards of recyclables x cost/cubic yard) =	$_____
4.	Revenue generated by selling recyclables.	$_____/year
5.	Amount saved through waste reduction activities (this includes ordering less paper, purchasing fewer disposables, etc.).	$_____/year
6.	Potential cost of implementing a waste reduction and recycling program, including investments in recycling equipment and durable goods.	$_____/year
7.	Collection of recyclables.	$_____/year
8.	Labor costs (# of employees x # hrs/wk x wage). Recycling coordinator Supporting staff	 $_____/year $_____/year
9.	Added cost of purchasing recycled products (e.g., recycled paper).	$_____ /year
10.	Financial benefit of a waste reduction/recycling program (#3 + #4 + #5)	$_____ /year
11.	Financial cost of a waste reduction/recycling program (#6 + #7 + #8 + #9).	$_____/year
12.	Benefit/cost of a waste reduction/recycling program. (#10-#11)	$_____/year

Appendix D

Technical Assistance Tools/Programs

The following web sites and contacts may be beneficial to your school as it develops and implements its sustainability program.

Outdoor Environment/Grounds Maintenance

New Jersey Sustainable Schools Network – Greenhouse Gas Emissions Calculator and Resource Guide, http://www.globallearningnj.org/OurShr.htm.

Union of Concerned Scientists – Information on cleaner school buses, http://www.ucsusa.org/clean_vehicles/trucks_and_buses/.

King County Metro Employer Commute Services Office – 206-684-4444, http://www.metrokc.gov/kcdot/alts/employer/.

Reduction of Fertilizers/Pesticides/Water for the Grounds

Washington Toxics Coalition – Model Least-Toxic IPM Policy for school districts, http://www.watoxics.org/pdffiles/IPMPolicy.pdf.

Environmental Protection Agency – IPM for Schools, 250-page notebook on how to practice IPM. Available on-line at http://www.epa.gov/region9/toxic/pest/school/ or call Don Priest at 206-553-2584.

Promoting the Outdoors as a Learning Environment

Urban Reforestation and Habitat Restoration Grant Fund – Annual county grant program awarded to agencies for reforestation or restoration of existing urban sites, http://dnr.metrokc.gov/wlr/LANDS/urhrdesc.htm, Kate Stenberg at 206-296-7266 or e-mail to kate.stenberg@metrokc.gov

Coalition for Schoolyard Habitat Programs – Use schoolyards to study natural habitats; call Mimi Dunn at 908-637-4125.

Indoor Environment/Air Quality

The Janitorial Products Pollution Prevention Project (JP4) – This project is sponsored by the U.S. Environmental Protection Agency, State of California, Santa Clara County, the City of Richmond, and the Local Government Commission. The purpose of these projects is to interview janitors and study workers' compensation data; review specific chemicals and specifications; and develop fact sheets and workshops to advise users on the health, safety, and environmental consequences of their janitorial products and where to go from here. The JP4 website offers many resources, such as tools, fact sheets, and a workshop outline. http://www.westp2net.org/Janitorial/jp4.htm

Environmental Protection Agency – Indoor Air Quality Tools for Schools, Comprehensive information on indoor air quality topics for schools, http://www.epa.gov/iaq/ia-intro.html

Community Outreach/Curriculum Integration

American Forum for Global Education – *The Paper Trail: Connecting Economic and Natural Systems,* by Winifred Armstrong & Margaret Mansfield. American Forum for Global Education, 120 Wall St., NY, NY 10005, 212-624-1412, http://www.globaled.org/order.html. This four-week curriculum unit is designed to teach

students how human choices about production, consumption, and disposal affect, and are affected by, the earth's natural systems. The format includes daily objectives, guiding questions, hands-on activities, student handouts, graphics, homework, glossary, teacher resources, an assessment rubric, and resource listings including websites. Price: $25.00.

Environmental Education Resources and Clearinghouses

Washington State Office of Environmental Education – A comprehensive listing of available curricula, reference materials, audio-visual materials and videos in four major areas: Fresh and Marine Water Quality/Salmon; Pollution and Recycling; Agriculture and Energy; Ecology, Population and Ethics. http://www.k12.wa.us/envedu/

Charlotte – The Charlotte site, a product of the Association for the Promotion and Advancement of Science Education, is dedicated to making science accessible and enjoyable for learners of all ages, with a special emphasis on assisting teachers and elementary school students. http://www.swifty.com/apase/charlotte/

EE-Link – The mission of EE-Link is to spread information and ideas that will help educators explore the environment and investigate current issues with students. This site is a good resource for both teachers and people who support K-12 environmental education, such as media specialists, in-service providers, nature center staff, and curriculum developers. EE-Link is a project of the National Consortium for Environmental Education and Training. http://eelink.umich.edu/

EEN – The Environmental Education Network (EEN) is a collaborative effort among educators, the EnviroLink Network, and the environmental community to bring environmental education on-line and into a multimedia format. The EEN will act as a clearinghouse for all environmental education information materials and ideas on the Internet. http://www.envirolink.org/enviroed/

NAAEE – North American Association for Environmental Education is a network of professionals and students working in the field of environmental education throughout North America and in over 55 countries around the world. NAAEE uniquely combines and integrates the perspectives of environmental interest groups and organizations and takes a cooperative, non-confrontational approach to promoting education about environmental issues. http://naaee.org/

NEEAP – The National Environmental Education Advancement Project, located at the University of Wisconsin-Stevens Point, is a national organization which aids state and local environmental education leaders in promoting their environment education efforts and develops informational items on building state capacities for environmental education. http://www.uwsp.edu/cnr/neeap/

SEER – The State Education and Environment Roundtable is working to improve learning by incorporating environmental curricula into K-12 education. Twelve state departments of education are already active participants in the Roundtable. A major part of their work relates to gathering and disseminating research about systemic approaches to incorporating environmental education into education reform. http://www.seer.org/

The above list of websites was taken from the Washington State Office of Environmental Education Website at http://www.k12.wa.us/envedu/

Energy Conservation

Puget Sound Energy, Energy Efficiency Services – Site Inspections, Audits, Grants for increasing energy efficiency in your gas or electric heating system, 1-800-225-5733.

Energy Efficiency Hotline – Current information on rebates for energy saving purchases and tips on how to save energy, 1-800-562-1482. www.pse.com

Washington State University Cooperative Extension Energy Program: www.energy.wsu.edu. Also see their Energy Efficiency Measures and Ideas Web site: www.energyideas.org

Green Schools Program of the Alliance to Save Energy – Combines energy efficiency management and building retrofit intervention with student involvement. Software program to track energy use included. 202-530-2215. http://www.ase.org/greenschools/

EnergyStar for Schools – U.S. Environmental Protection Agency Program. Curriculum, software and recognition for schools that have worked to save energy. http://yosemite1.epa.gov/estar/business.nsf/webmenus/Schools

U. S. Department of Energy – Office of Energy Efficiency and Renewable Energy. Offers many ideas for saving energy in schools, which reaps special benefits, since it not only increases student comfort and performance, but it also saves school districts money, allowing them to channel more resources toward education. http://www.eren.doe.gov/EE/buildings_specific.html

Curriculum

The Institute for Global Environmental Strategies has a collection of lessons on the potential consequences of climate variability and change available for free and listed on the web at www.strategies.org/climate.html.

Puget Sound Energy – In Concert with the Environment. Students use computers to explore how home energy use and the environment are related. http://www.pse.com/community/programs/inconcert.html

Oregon Green Schools Association – Assessment tools for students to perform audits on energy, water and materials use in the school. Comprehensive set of questions in each area. http://www.deq.state.or.us/wmc/solwaste/documents/schtools.pdf

Water Education for Teachers – The goal of Project WET is to facilitate and promote awareness, appreciation, knowledge, and stewardship of water resources through the development and dissemination of classroom-ready teaching aids and through the establishment of state and internationally sponsored Project WET programs. http://www.montana.edu/wwwwet/

Environmental Protection Agency – Environmental Education Center. Curriculum resources, activities and grants in water conservation. http://www.epa.gov/teachers/

Student Involvement

Watt Watchers of Texas. This program enlists students to look for energy waste in their schools by patrolling the hallways looking for empty classrooms with the lights on. The students turn out the lights and leave a reminder "ticket" for the teacher. Students can also close exterior doors, report stuck flush valves, implement power management in computers, and more.. Full information on the program and sample forms can be downloaded from http://wattwatchers.utep.edu/.

U. S. Department of Energy – Office of Energy Efficiency and Renewable Energy. Offers many ideas for saving energy in schools, which reaps special benefits, since it not only increases student comfort and performance, but it also saves school districts money, allowing them to channel more resources toward education. http://www.eren.doe.gov/EE/buildings_specific.html

Appendix E

Example of Sustainable School Program

Komachin Middle School, Lacey, Washington

Using a Learn and Serve grant from OSPI, Komachin Middle School is creating and modeling a more sustainable school through activities such as creating an outdoor garden, installing storm water filtration system, and developing a comprehensive recycling program. This initiative is an effort to take their schoolwide theme of "Sustainable Communities" and value of service to another level.

Komachin's "sustainable school" project has been dovetailed to their ongoing "Sustainable Communities" biannual integrated project. Komachin defines a sustainable community by the following indicators:

- Preserves the biodiversity of our natural environment.
- Reduces resource consumption and recycles waste.
- Involves public participation.
- Encourages social harmony.
- Promotes health and wellness.
- Includes basic needs met.

Komachin's "school sustainablity" goal is to provide hands-on laboratory practice and modeling of sustainable practices in the content of science under the umbrella of their six indicators.

1. Resource consumption: waste reduction, reuse, and recycling; water recycling (rain barrels/storm drain pond).
2. Biomass recycling (composting).
3. Biodiversity: habitat restoration (pond, off-site riparian restoration, butterfly garden), native plant propagation, and native plant garden.
4. Basic needs met: organic vegetable gardening.
5. Social harmony: opportunities for students to work together to solve problems to directly benefit their school.
6. Public participation: provide opportunities for students to work to better their school, provide opportunities for community partnerships with school. The nature of the relationship with community moves from funder or critiquer to true involvement and partnership.
7. Health and wellness: provide opportunities for students to engage in physical work during the school day, model healthy food choices.

Rather than aiming to become a self-sustaining school in terms of resource consumption and budget, Komachin has adopted the goal of modeling environmental best practices. It is realistic for the school to save money on resource consumption and to that end they are exploring with their district incentives for the money they save the district. Komachin realizes that success in actualizing their sustainability vision depends on student participation and enthusiasm.

Sample School District Sustainability Policy

School districts and individual schools have developed policies for implementation of waste reduction and recycling programs, including procurement issues. In some school districts, these efforts are part of a more complete resource conservation or sustainability program. The sample School District Sustainability Policy contains provisions for buying recycled items.

Policy Components

Mission Statement:

The _____School District will develop and implement sustainability principles and practices throughout the school district. The School District will operate a sustainability program that includes waste reduction, reuse, recycling, procurement practices, resource conservation, and sustainability education for students and staff.

Goals:

- Develop and enact an environmentally preferable purchasing policy reflecting sustainability principles when it is reasonably cost effective.
- Reduce the amount of waste generated by schools.
- Reuse materials when safe and practical.
- Recycle as many materials as practical.
- Educate administrators, staff, and students in sustainability principles, waste reduction, reuse, recycling, and purchasing practices.
- Meet the requirements for recycling procurement established by RCW 43.19A.

Objectives:

- Protect our environment.
- Reduce pollution.
- Reduce waste disposal costs.
- Save landfill space.
- Increase environmental awareness.
- Save energy.
- Provide students with modeling and tools for future use in creating sustainable environments.

Specifications: District

- Designate a procurement officer to serve as primary contact with the Department of General Administration to respond to requests for information.*
- Review and revise procurement policies and specifications to ensure that they do not exclude environmentally preferable products and services.
- Evaluate hazardous chemicals (cleaning, classroom, and science laboratory) and replace with safer alternatives.
- Form a district sustainability team to develop a comprehensive sustainability program.
- Implement school district sustainability program.
- Establish a monitoring process for costs, savings, and materials purchased and recycled.
- Coordinate efforts with each school in the district and other school districts when appropriate.

*Required by State law

Specifications: School

- Recycle all paper products when economically and technologically possible including, but not limited to, white paper, computer paper, colored paper, cardboard, and mixed paper.
- Recycle aluminum and other metal.
- Recycle glass and plastic food and beverage containers, where possible.
- Recycle or compost kitchen wastes when feasible.
- Use least risk alternatives in laboratory experiments and custodial operations.
- Develop sustainability strategies for transportation operations.
- Monitor purchasing practices and conserve materials for classroom consumption when possible.
- Educate all administrators, teachers, staff, and students in sustainability principles.
- Keep records of costs, savings, and amounts of resources conserved, reduction in waste accomplished, materials recycled, and environmentally preferable purchases made.

Additional benefits:

- Develop a model sustainability program that will be transferable to other school districts.
- Reduce or eliminate non-school waste dumping at the _____ School District.
- Seek out opportunities for new and innovative methods of contributing to a sustainable school and community.
- Set an example for other major organizations in _____County.

Other Resources

For a sample resource conservation management resolution for school boards, visit the Department of General Administration's website: http://www.ga.wa.gov/Eas/rcm/policy.html or call 360-902-7197. Also, the Washington State School Directors' Association (WSSDA) offers assistance with policy development to schools throughout the state.

Appendix F

Laws and Directives

The Washington Administrative Code establishes environmental education as an interdisciplinary instructional requirement in Washington State schools in grades K-12. "Pursuant to RCW 28A.230.020 instruction about conservation, natural resources, and the environment shall be provided at all grade levels in an interdisciplinary manner through science, the social studies, the humanities, and other appropriate areas with an emphasis on solving the problems of human adaptation to the environment." (WAC 180-50-115)

Environmental Education Guidelines for Washington Schools, published by the Superintendent of Public Instruction in July 2000, offers a wealth of relevant advice. It is available on-line at http://www.k12.wa.us/envedu/ or from Washington State Office of Environmental Education, Office of Superintendent of Public Instruction, 2800 NE 200th Street, Seattle, WA 98155-1418 206-365-3893.

In 1989 the Washington State Legislature passed into law ESHB 1671, the "Waste Not Washington" Act. This bill, largely incorporated into RCW 70.95, included many provisions for handling and disposal of solid waste, established solid waste management priorities, targeted recycling rates in Washington State, and required development of K-12 school waste reduction and recycling programs.

Washington's "Buy-Recycled Law" (RCW 43.19A, Recycled Product Procurement) requires public schools to substantially increase the procurement of recycled content products.

Executive Order

In September of 2002, Governor Gary Locke issued Executive Order 02-02, Sustainable Practices by State Agencies. This orders calls for sustainable environmental practices for all state agencies. The goal is to use human, environmental, and economic resources more wisely, including the use of energy efficient products, recycled materials, and conservation programs.

The executive order guides Washington state government's long-term sustainability practices and will strengthen the state's economic and environmental vitality. This includes using the state's $1 billion in purchasing power for environmental products and conservation.

The executive order directs state agencies to establish sustainability objectives and prepare a biennial sustainability plan to modify their practices. It also calls for the Office of Financial Management to designate a person to assist state agencies in meeting their goals and establishes an advisory council to advise state agencies on how to apply sustainability measures to government operations. To review the Office of the Governor's Web site, visit www.governor.wa.gov.

(*The Governor also invited institutions of higher education, **public schools**, elected officials, commissions, and others to participate in implementing this executive order within their organizations.*)

Appendix G

Glossary

Aluminum – A silvery nonferrous metal found in the ore bauxite. It is used to make hard, light, corrosive-resistant materials such as beverage cans and food-service containers. It is easily recyclable.

Avoided Costs – Costs for services such as dumpster fees that are reduced or eliminated by waste reduction and recycling methods.

Baler – A machine that compacts waste materials to reduce volume, usually into rectangular bales, which makes the materials ready for marketing.

Bauxite – The clay-like ore from which most aluminum is made.

Biodegradable – An organic material is biodegradable if it can be broken down by microorganisms into simple, stable compounds such as carbon dioxide and water. Food and paper are examples of biodegradable organic products.

Boxboard – Paper used in manufacturing cartons and rigid boxes.

Buy-Back Recycling Center – A commercial recycling facility that purchases postconsumer recyclable materials from the public.

Central Collection Site – A designated site in a school building for collecting recyclable materials.

Collection Center – A site designed to accept recyclable materials from individuals.

Collection System – Collectors and equipment used for the collection of solid wastes or recyclables. Collection systems may be classified by mode of operation, equipment used, and types of materials collected.

Commercial Waste – Waste from all nonresidential sources.

Commingled Collection – Collection of several types of recyclable materials in one container.

Compost – The stabilized and sanitized product of composting, which is beneficial to plant growth; it has undergone an initial, rapid stage of decomposition and is in the process of humification.

Composting – A biological process which stabilizes organic matter for use in soil enhancement. Compostable items include yard and garden waste, and food wastes.

Cullet – Crushed scrap glass, used as part of the batch to make new glass.

Curbside Collection – Home or residential collection programs where recyclables are set out and collected at the curb for hauling to processing facilities.

Degradable – Capable of being chemically or organically reduced or degraded.

De-inking – The removal of ink, filler, and other nonfibrous material from printed waste paper.

Drop Box – Container used to collect self-hauled waste or recyclable, separated materials from individuals and businesses.

Dumpster – A large, outside trash collection receptacle, designed to be hauled away, emptied, and returned to the collection site.

Ecology – The interrelationships between organisms and their environment.

End User – Mills and other industrial facilities where secondary materials are converted into new materials. Paper mills, steel mills, and glass container production plants are examples of end users.

Environmentally Preferable Purchasing (EPP) – Environmentally preferable purchasing is the acquisition of products or services that have a lesser or reduced negative effect on human health and the environment when compared with competing products or services that serve the same purpose. This takes into consideration the impacts of a product and packaging throughout the entire life cycle, including final disposition.

Feedstock – Raw materials input to a process.

Generator – An individual, company, organization, or activity that produces wastes or secondary materials.

Glass – Any of a large class of materials that solidify from a molten state without crystallization, and are generally clear or colored green or brown.

Grade – A class of secondary material that is distinguished from similar classes on the basis of quality, color, use, content, appearance, contamination, density, or other factors.

HDPE – High-density polyethylene, a plastic resin used to make plastic containers such as milk jugs and detergent containers. In the national plastic coding system HDPE is number two.

High-Grade Waste Paper – White computer paper and white ledger paper are examples of high-grade paper.

Humus – The organic portion of soil created by the partial decomposition of organic matter.

Humification – A process of storing organic energy into compounds of high molecular weight which are slowly degrading.

Igloo or Dome – A half-sphere container used at schools and drop-off centers for the receipt and storage of recyclable materials.

Kraft Paper – A coarse, brownish paper noted for its strength, used in shopping bags and corrugated cardboard.

Landfill – A disposal facility at which solid waste is placed in or on land. See also Sanitary Landfill.

Leachate – Liquid that has percolated through solid waste in a landfill, or has been generated by decomposition of solid waste. This liquid may contaminate ground or surface water and is especially a problem in areas of high rainfall and porous, sandy-gravelly soil.

LDPE – Low-density polyethylene, a plastic resin used in cosmetic packaging and filmy plastic bags. In the national plastic coding system LDPE is number four.

Mandated Recycling – Programs that require by law certain recycling practices or results.

Material Recovery Facility (MRF) – A MRF is a facility in which mixed recyclables are separated from each other and processed to the specifications of the markets for each material.

Materials Management – A comprehensive approach to the acquisition and effective use of material products, and—once their usefulness as products is exhausted—their recycling as raw materials for further production or environmental benefit.

Micro-Scale Chemistry – Scaled-down versions of laboratory experiments. Micro-scale chemistry reduces the amount of chemicals used, amount of waste produced, and the amount of waste for disposal.

Mixed Paper – Waste paper of various kinds and quality, usually collected from stores, offices, and schools; for example, colored paper.

Municipal Solid Waste (MSW) – Solid wastes generated by residents, businesses, and schools.

Neutralization – A step in the laboratory procedure of a chemistry experiment that adds a compound which treats a hazardous material and renders it into a nonhazardous state.

Operating Costs – Recurring program costs, such as labor, equipment operation, maintenance, utilities, administration, and promotion.

Paper – A thin material made of cellulose fiber pulp, derived mainly from wood. Paper can be recycled many times before its fibers become too short for reuse.

Paperboard – Paperboard is a distinguished from other paper by being heavier, thicker, and more rigid.

PET – Polyethylene terephthalate, a plastic resin used to make beverage containers. In the plastic coding system PET is number one.

Plastic – Any of a large class of complex, organic compounds made from hydrocarbons. Plastic can be molded or cast into various shapes and films.

Pollution – Material wasted in a way that does much more harm than good. For instance, air pollution is really material that has been wasted by an inefficient factory, automobile engine, or wood stove.

PP - Polypropylene – A plastic resin used to make containers that hold products poured in hot, such as molasses or syrup containers. It is also used for some yogurt tubs and medicine bottles. In the national plastic coding system PP is number five.

PS - Polystyrene – A hard, dimensionally stable thermoplastic that is easily molded. Polystyrene is used to make cups for hot drinks. It is also used to make the "peanuts" used as packing materials. In the national plastic coding system PS is number six.

Recycling – Separation of recoverable materials from the waste stream and reprocessing these materials for use in the manufacture of new products. Recycling includes "closing the loop" by purchasing recycled and recyclable materials.

Recycling Center – A site where manufactured materials are collected to be resold for reprocessing.

Resource Conservation Program – A well-coordinated effort to manage the resources and services used, and the waste generated, by a facility.

Resource Recovery – The extraction of economically usable materials from waste.

Sanitary Landfills – Specially-engineered landfills that have impermeable liners to block the movement of leachate into ground water, a leachate collection system, gravel layers permitting the control of methane, and other features. Each day's garbage is covered with a layer of earth.

Source Separation – The separation of different kinds of solid waste at the place where the waste originates. Examples of source separation are sorting out recyclable materials from nonrecyclables in business, household, or school wastes.

Sustainability – As used in relation to the economy and the environment, this term means meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Throwaway – A disposable waste item, not designed for reuse or recycling.

Tipping Fee – The charge made for unloading waste at a landfill, incinerator, or recycling center.

Vermicompost – Mixture of partially decomposed organic waste, bedding, worm castings, and other associated organisms.

Vermicomposting – The use of worms to digest raw or stabilized organic waste, usually food waste.

Waste Audit – An inventory of the amount and type of waste that is produced at a specified location.

Waste Management – Devoting a lot of time and money toward disposal of material you probably didn't need in the first place.

Waste Reduction – The prevention or elimination of waste at the point of generation. Reduction aims at not generating waste in the first place, using less toxic alternative products, and reusing materials.

Waste Stream – The waste material output of an area or facility.

Yard Waste – Grass clippings, leaves, and tree trimmings from yards and landscaped areas